NAME: DATE:

Unit-2 Mastery Assessment (version 617)

Question 1 (10 points)

Let f represent a function. If $f[3] = 16$, then there exists a knowable solution to the equation below.

$$y = 2 \cdot \left(f\left[\frac{x}{7} - 4 \right] + 9 \right)$$

Find the solution.

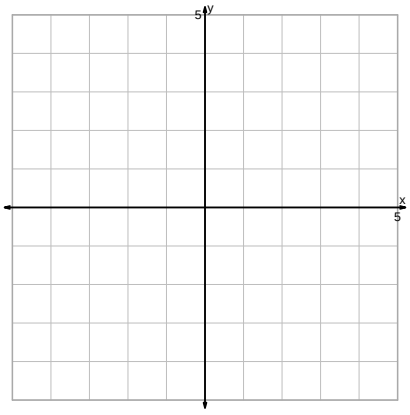
$x =$

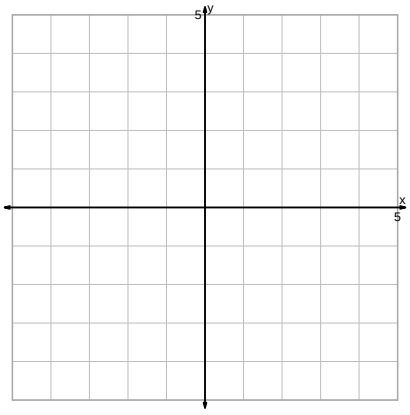
$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

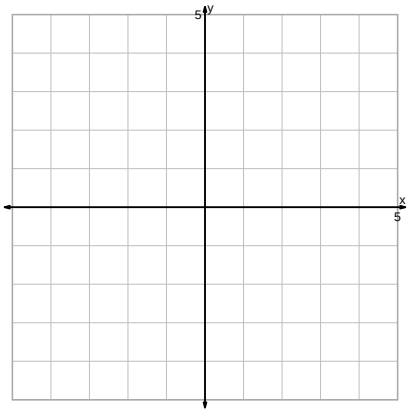
$y = 2^{x+2}$

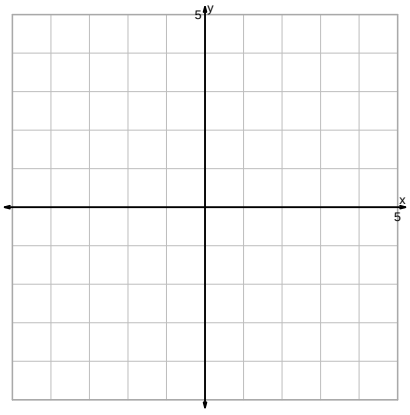




$y = \frac{x^2}{2}$

$y = \sqrt[3]{x} + 2$

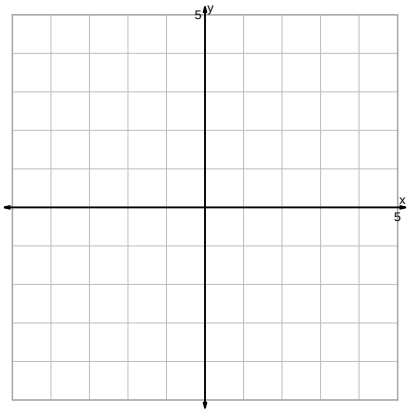


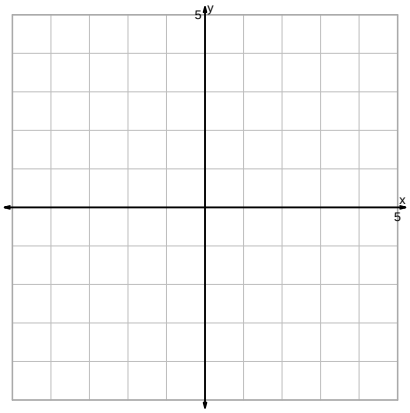


$y = \left(\frac{x}{2} \right)^3$

Question 2 continued...

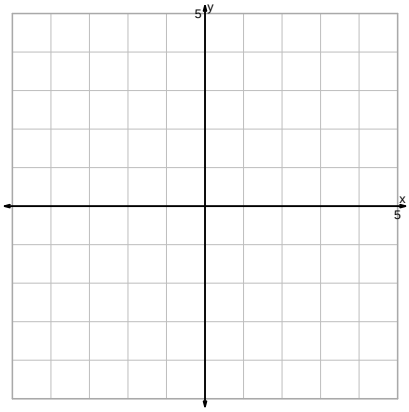
$y = 2 \cdot \sqrt[3]{x}$

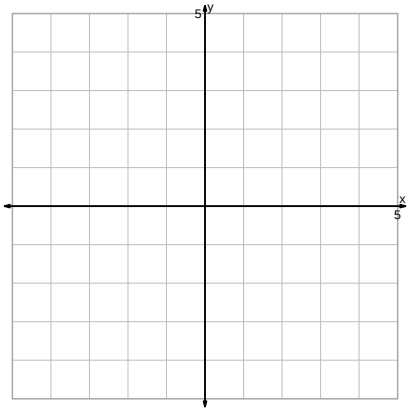




$y = \sqrt{x} - 2$

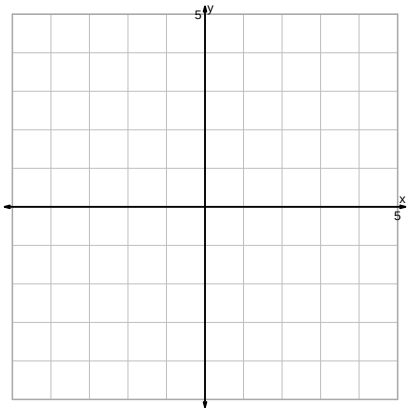
$y = \left(2x\right)^2$

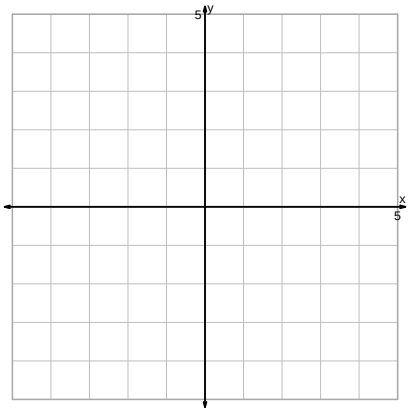




$y = \sqrt{-x}$

$y = -\log_2\left(x\right)$

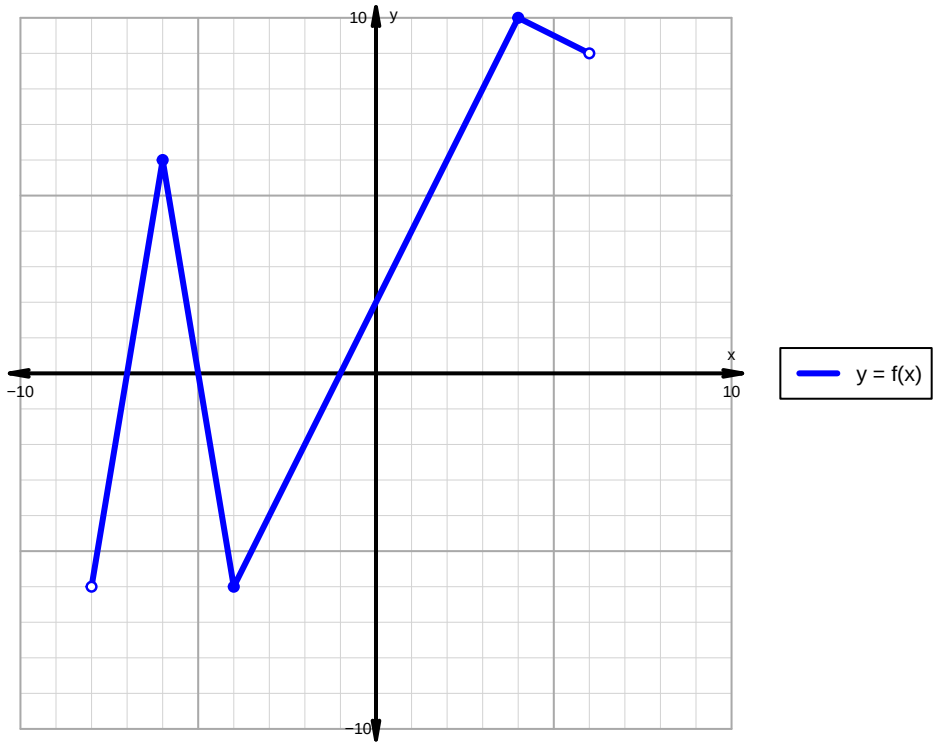




$y = \log_2\left(x - 2\right)$

Question 3 (20 points)

A function is graphed below.



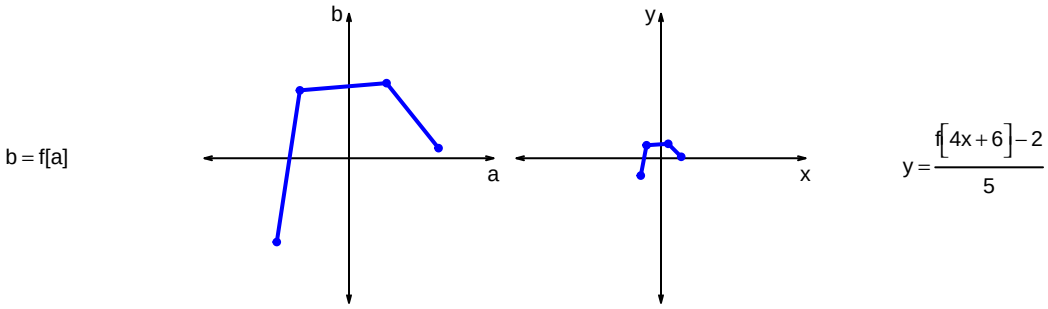
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = \frac{f[4x+6]-2}{5}$ are represented below in a table and on graphs.

a	b	x	y
-50	-58	-14	-12
-34	47	-10	9
26	52	5	10
62	7	14	1



a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = \frac{f[4x+6]-2}{5}$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

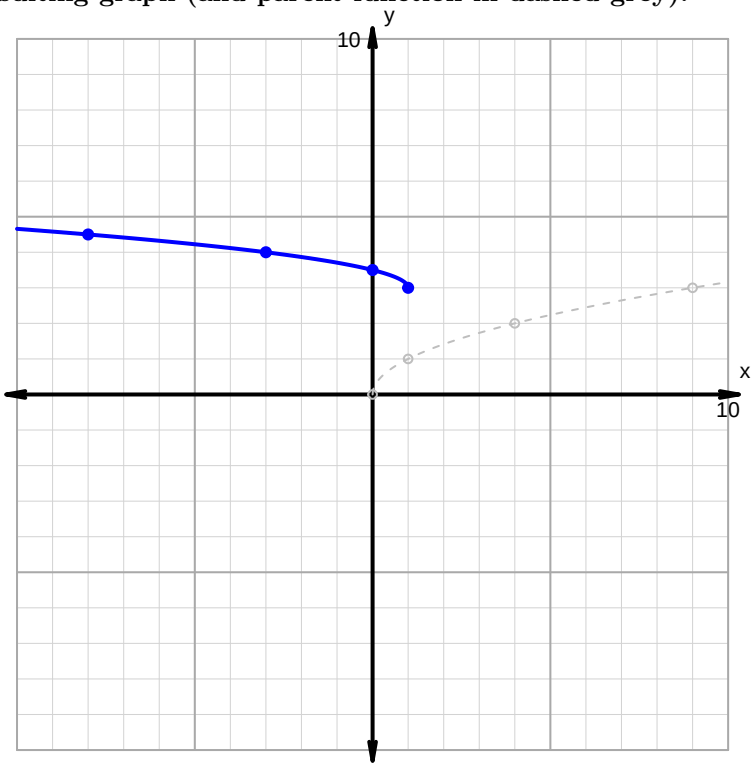
Horizontal transformations

1. Horizontal reflection over y axis.
2. Translate right by distance 1.

Vertical transformations

1. Vertical shrink by factor 2.
2. Translate up by distance 3.

Resulting graph (and parent function in dashed grey):

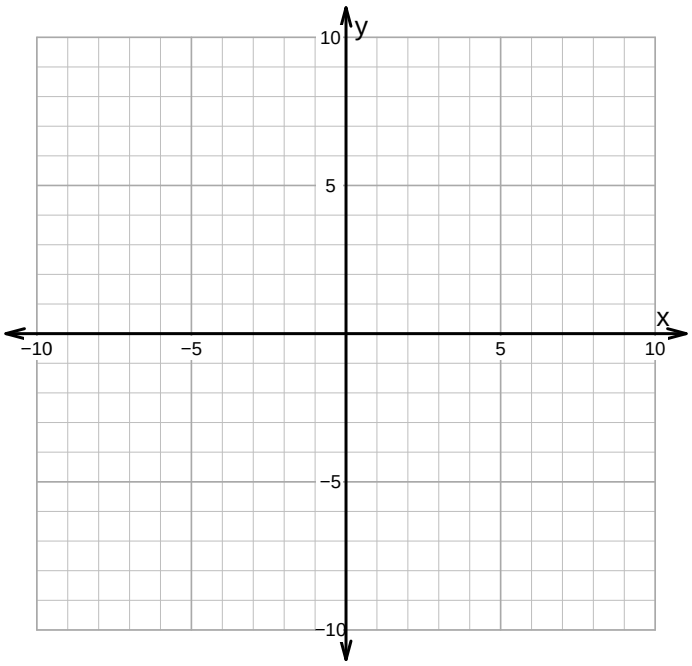


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{1}{2} \cdot |x - 1| - 3$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	